

Amendments to the Specification:

Please replace paragraph [34] with the following amended paragraph:

[34] FIG. 2B shows the chamber of ~~FIG. 2~~ FIG. 2A in a vacuum chamber, with the state-change mixture being stabilized with liquid extraction alone exerting a consolidation force on the bodies of the mixture;

Please replace paragraph [85] with the following amended paragraph:

[85] Valves 88, 95 and 99 may be included at the openings from manifold 42 to transfer system 84 and mold containers ~~95 and 98~~ 97 and 100 that are likewise connected to the manifold. While not essential for operation of the system, such valves can serve at least two purposes. One is to isolate mixtures not undergoing state-changes, so as to minimize the amount of transition liquid 10 that must be transferred to effect the mobile-solid transitions. In addition, these valves would allow impression-capturing operations to take place independently in the containers 97 and 100, which can be connected to or isolated from transfer system 84 by the valves.

Please replace paragraph [112] with the following amended paragraph:

[112] FIG. 10A shows a state-change ~~mixture-185~~ mixture 182 that has a state-change carrier liquid medium. This might be, for instance, a paraffin or a eutectic alloy that changes from a liquid to a solid at a temperature that is useful for mold or tool applications. As earlier described, the bodies of the mixture are preferably of the same density as the liquid so as to be neutrally buoyant. For instance paraffin and polyethylene beads have practically the same density, while indium-based eutectic alloys have densities that can be matched by various copper, lead and tin-alloy beads or bodies. The membrane 32 that allows the ambient-pressure stabilization of the mixture is shown being removed. If, for instance, the indium alloys were used with hard metal beads to which there is good alloy adherence, the resulting form would be a substantially hard-

surfaced metal tool that is suitable for stamping, high-pressure injection molding and the like. Prior to cooling the mixture except at the surface and after the bodies are consolidated, the mixture might be drained to create a porous substructure so that molten liquid could be reintroduced into the interstices to effect a rapid melting of the bonds between the bodies. Heated air, steam or like gases might also be used to preheat the consolidated and solidified mass prior to heated liquid medium introduction.

Please replace paragraph [126] with the following amended paragraph:

[126] The process begins with air being evacuated between the pattern and the membrane cap while the mixture is at ambient pressure. Air is then extracted from the mixture to allow atmospheric pressure acting on the cap and pattern to compress the mixture against the pattern; however, the extraction proceeds in pulses, with air being added and then cut off through the upper ports 230 as vacuum 195 is also turned on and off. This variation in pressure causes atmospheric pressure 223 against cap 220 to intermittently press on the mixture, thereby periodically relaxing the compression forces on the mixture as it is progressively consolidated. Air pressure above atmospheric could also be periodically applied through the vacuum port to further aid in progressively compressing and relaxing the mixture to allow the bodies to move into a close-packed configuration within the container and against the pattern. After consolidation the mixture can be hardened by an appropriate process such as heating, drying or cooling, depending on the properties of the binding liquid.

Please replace paragraph [133] with the following amended paragraph:

[133] In construction this hollow thin-shell structure has the same elements as envelope 269 including flexible reinforcement (not shown), screen elements 285 and support elements 279. However, elements 279 are attached to another tubular feed element 292 that may itself contain state-change materials and so be flexible, or that may be permanently stiff to aid handling and

positioning. ~~Element 282~~ Element 292 may also contain feed tube 295 that transfers the liquid medium of the state-change mixture into and out of the hollow envelope structure via the support and screen elements as previously described. Tubular element 292 may also incorporate screen elements along its length to facilitate the transfer of liquid into and out of element 292 or the elements 279 into which it would branch.

Please replace paragraph [139] with the following amended paragraph:

[139] Plate 332 and seal 329 may be replaced by a flexible, conformable cap such as cap 220 described with reference to FIG. 12C as necessary. If for instance the pattern part is a flexible shell, then the conformable cap would equalize the stresses upon the part exerted by atmospheric pressure as the air is evacuated between surface ~~membrane 227~~ membrane 327 and the part. Valves 340 are then opened and pump 319 is used to extract the transition liquid, thus consolidating the bodies of the mixture. As this liquid is extracted the membrane, plate and pattern is pressed down against the mixture by atmospheric pressure, assuring that close-packing of the bodies occurs against the membrane surface and so against the pattern.